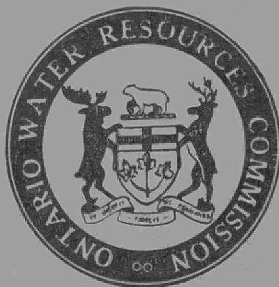


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O.W.R.C.
Water
Pollution
Survey

THE
ONTARIO WATER RESOURCES
COMMISSION



WATER POLLUTION SURVEY

of the

TOWN OF GORE BAY

DISTRICT OF MANITOULIN

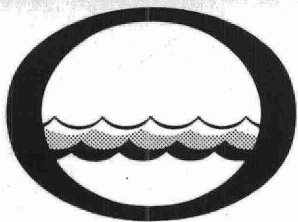
1969

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Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7, Ontario
Tel. 365-1655

November 24, 1969.

The Town of Gore Bay
GORE BAY, Ontario

Attention: Mr. W.T. Clarke, Clerk-Treasurer

Dear Sir:

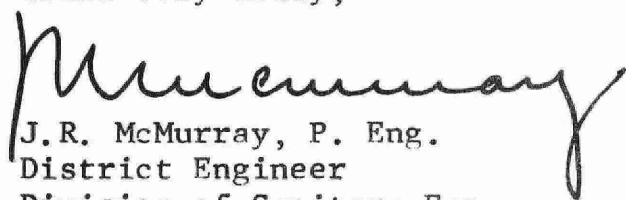
Re: Town of Gore Bay - Water Pollution Survey

We are enclosing a copy of the report prepared by our Division of Sanitary Engineering subsequent to a survey of the above mentioned municipality on June 25 and July 24, 1969.

The report reviews the status of the Town of Gore and indicates that the local creeks and bay are continuing to be polluted by domestic wastes. Since the ultimate solution to the problem is to install a sewage treatment facility and extend the collector system to all unsewered areas, the report recommends that the municipality proceed with the construction of such works as soon as possible. The implementation of a sewage works programme and a statement by The Honourable George A. Kerr, Q.C., Minister of Energy and Resources Management, concerning two major financial programmes to assist municipalities in projects related to sewage works have been appended to the report for your information. If there are any aspects of this report that council would like to discuss, we would be willing to attend a meeting at your request.

Would you please advise us of Council's intentions regarding the recommendation presented in this report.

Yours very truly,


J.R. McMurray, P. Eng.
District Engineer
Division of Sanitary Eng.

WBM/sg
Encl.

REPORT
ON A
WATER POLLUTION SURVEY
OF THE
TOWN OF GORE BAY
DISTRICT OF MANITOULIN

ONTARIO WATER RESOURCES COMMISSION
DIVISION OF SANITARY ENGINEERING
DISTRICT ENGINEERS BRANCH

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INTRODUCTION

A water pollution survey was conducted in the Town of Gore Bay during the Summer of 1969. Samples were obtained on June 25th and July 24th in an effort to locate and evaluate all existing sources of pollution. Such surveys are performed routinely and on request by the O.W.R.C.'s Division of Sanitary Engineering as a basis for determining water supply and sewage treatment requirements.

I General

The Town of Gore Bay is located on Manitoulin Island in the District of Manitoulin in the northern portion of the Township of Gordon. The Town is situated on the east slope of an escarpment bordering the south west shore of Gore Bay.

Two creeks flow through Town and empty into Gore Bay. Local Creek No. 1 flows in an easterly direction through the south-east section of the Town and acts as a receiving stream for road drains located along Main Street, eventually emptying into the southwest area of Gore Bay. Local Creek No. 2 flows in a northerly direction through the extreme southwest section of Town and acts as a receiving stream for a road ditch running along the north side of Hall Street and located between Concession Road No. 11 and Joseph Street. The above creek empties into the southern tip of Gore Bay, affording drainage to an area where the population density is much less than that of the area drained by Local Creek No. 1.

The 1968 assessed population of the Town of Gore Bay, according to the 1969 Municipal Directory, was 736 persons.

The Town provides the usual retail outlets and services of a farming area centre. Since the Town serves as a resort area during the summer months tourism is also a source of income for many of the residents. The Town itself is readily accessible by land, air and water, being located 5 miles north east of the only Airfield on the Island, adjacent to Highway 540 and situated on the south west shore of Gore Bay.

II MUNICIPAL SERVICES

The entire Town of Gore Bay is serviced by a municipal water supply system. Water is drawn from the North Channel by an intake pipe which is 8 inches in diameter and extends 490 feet into Gore Bay. Chlorination of the water supply is effected by an ADVANCE type gas chlorinator. The hypochlorinator, previously used to chlorinate the water supply is now being used as a standby Unit.

There are no sanitary sewers or sewage treatment facilities in the municipality and the disposal of sanitary wastes is effected by individual septic tank systems. The business section of Town is drained by a series of storm sewers that empty into Gore Bay.

III WATER USES

The most important use made of the water in Gore Bay is as a source of supply for the municipal water system. Secondary uses involve recreation and navigation during the summer months.

IV FIELD SURVEY

The field work associated with this survey was carried out on June 25 and July 24, 1969. The weather was sunny and mild during both investigations with a minimum amount of precipitation occurring between sample runs.

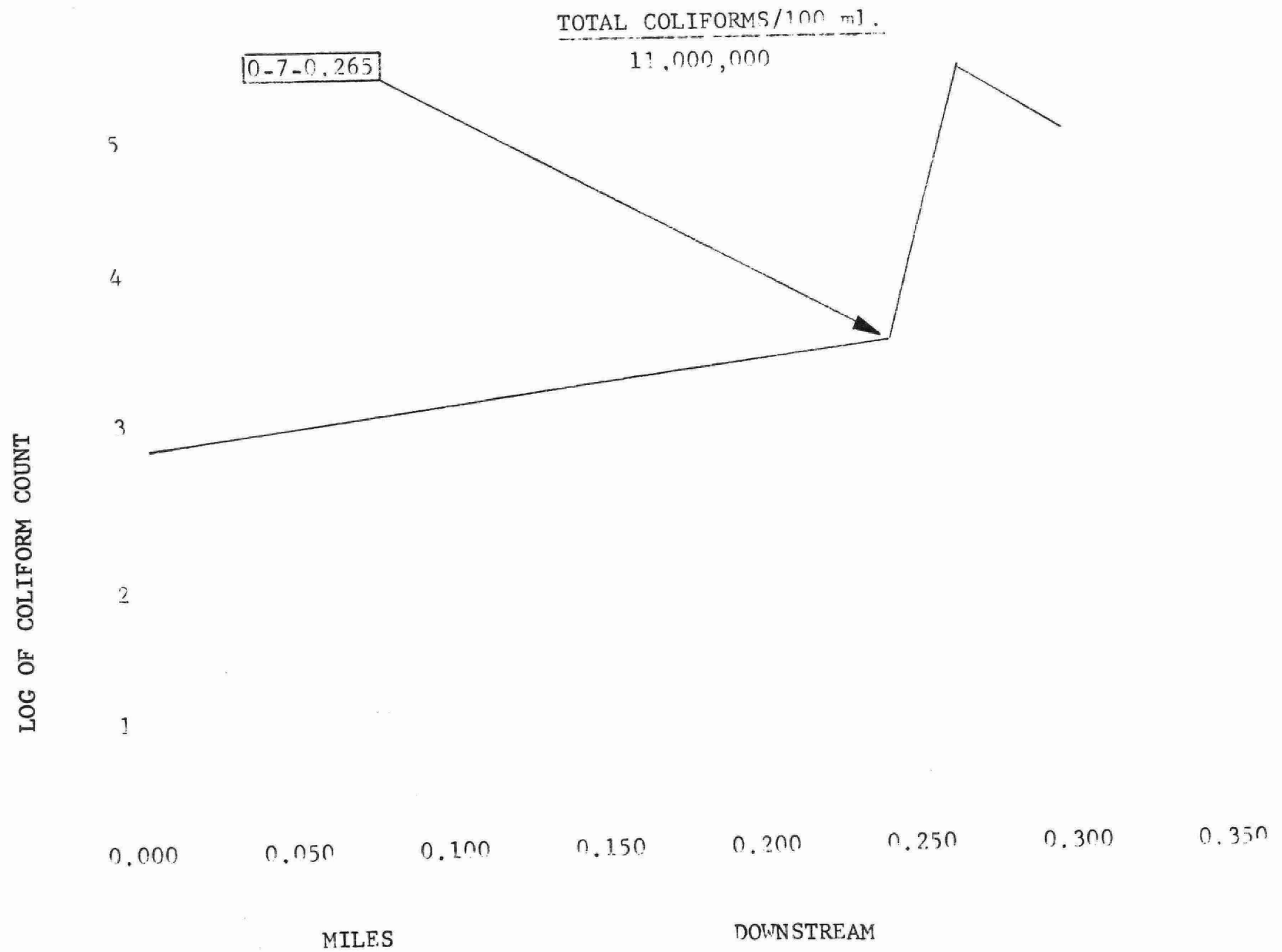
A total of 16 bacteriological samples and 15 chemical samples were collected during the two investigations and submitted to the O.W.R.C.'s Toronto laboratory for analysis.

Generally, both chemical and bacteriological samples obtained from the effluent of storm sewers located along the water front indicated the presence of pollutants. This, in conjunction with a strong septic odour emanating from the storm sewer outfalls and an unusual abundance of aquatic flora growing in the immediate area further indicated the discharge of nutrients into Gore Bay via the storm sewer network serving the Town. Similarly it was observed that organic nutrients were being discharged into Local Creek No. 1 from several road drains located along Main Street and particularly from one located in a dry wall bordering the east side of a car lot located on the north west corner of Meridith and Main Streets.

Graphs A and B, appended to this report illustrate the effect of the discharge of the above outfall on the stream quality of Local Creek No. 1.

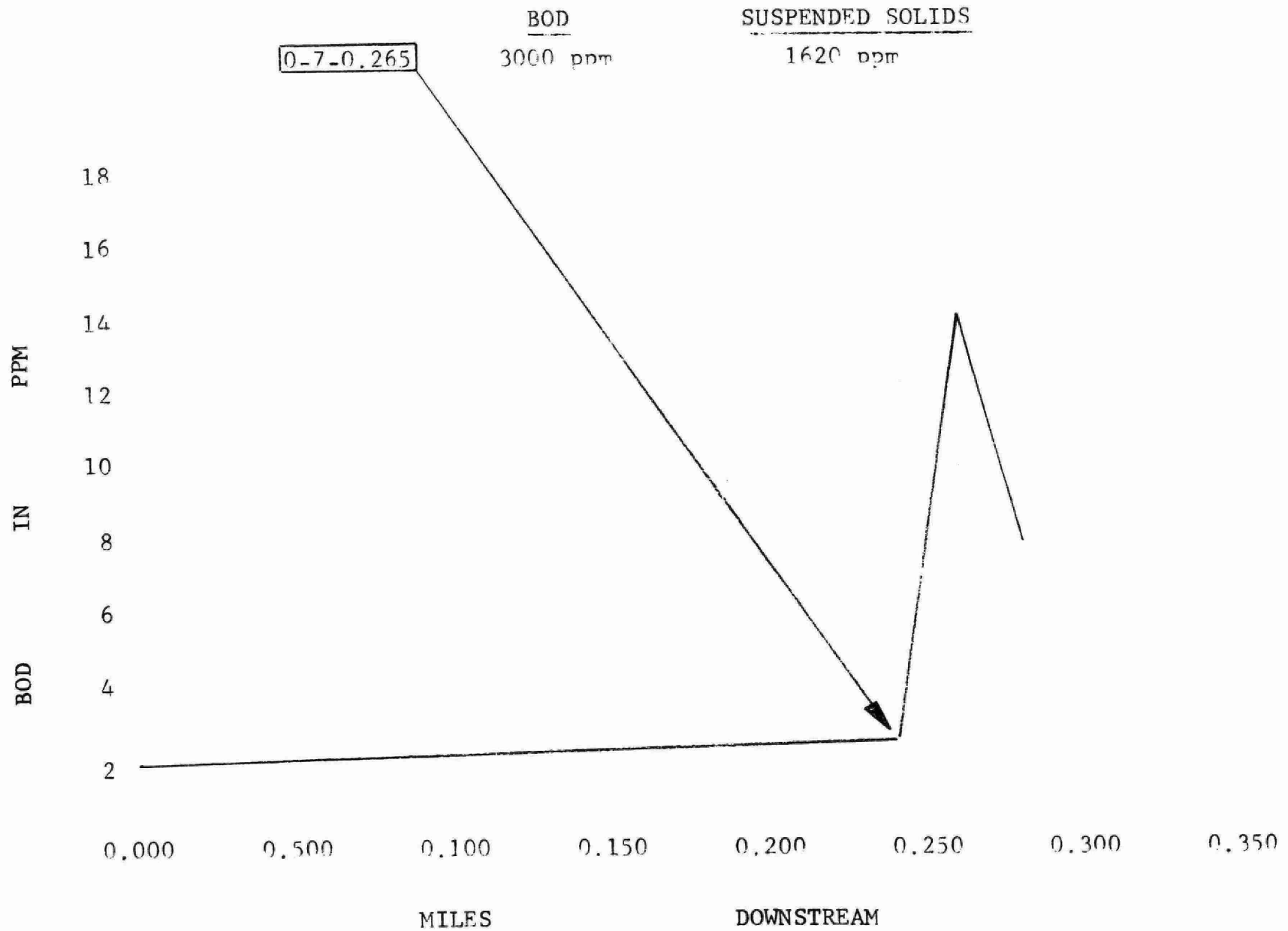
GRAPH "A"

LOG OF COLIFORM COUNT VERSUS MILES DOWNSTREAM



GRAPH "B"

BIOCHEMICAL OXYGEN DEMAND VERSUS MILES DOWNSTREAM



V (a) PRESENTATION OF RESULTS

Bacteriological

A total of 16 bacteriological samples, 8 outfalls, 7 stream and 1 ditch, were collected for analysis during the two investigations. All of the samples except two contained coliform organisms in excess of the recommended level of 2,400 coliform organisms per 100 ml. for bathing waters. Results such as the above would seem to indicate that domestic wastes in varying degrees are gaining access to the entire storm sewer collector system.

Results of the bacteriological analyses performed on the samples obtained from the storm sewer effluent can be found in Table I.

Further, a bar graph comparing the results of the total coliform organisms contained in the storm sewer effluent to the recommended maximum limit, can be found in Appendix A.

(b) Chemical

A total of 15 chemical samples, 7 outfalls, 7 stream and 1 ditch, were collected for analysis during the two investigations. Based upon the O.W.R.C. objectives for sewer outfalls of 15 ppm for both BOD and suspended solids, all of the sewer outfalls samples exceeded the objectives.

The analyses of the stream samples revealed the BOD at 66 per cent of the locations sampled exceeded the Commission's

objective of 4 ppm for natural watercourses. As previously mentioned in the presentation of bacteriological results, the analyses of the chemical samples obtained reveal the presence of domestic wastes in the effluent of the storm sewers serving the Town.

Results of the chemical analyses performed on the samples obtained from the storm sewer effluent can be found in Table II.

Further, two bar graphs illustrating the high level of pollutants being discharged into Gore Bay via the storm sewer system can be found in Appendices B and C.

VI EXPLANATION OF RESULTS

Appendix F explains the significance of the various tests conducted during the survey.

VII DISCUSSION

From the results of the chemical and bacteriological analyses performed on the samples collected during the two investigations it is evident that the Town of Gore Bay is contributing to the pollution of the waterfront of Gore Bay and to the local creeks which course through the Town.

Because of the heavy concentration of homes in the business section of Town, the average lot size is too small to support an individual septic tank system and effectively dissipate the associated domestic wastes. As a result, many residents are utilizing the storm sewers and local creeks as a means of disposing of sanitary

wastes. Currents and surface water movements associated with large bodies of water are minimal in natural bays and harbours. Consequently, the pollutants being discharged into Gore Bay are concentrated along the shoreline of the Town. Thus, swimming and bathing in the above area could represent a potential health hazard to individuals utilizing the water front for recreational activities. If pollution of this nature continues, the water drawn from Gore Bay could become seriously impaired within several years, resulting in the costly installation of additional water treatment equipment.

In order to avert such a situation, it is recommended that the Town of Gore Bay consider the installation of a municipal sewage works system. The methods of implementing such a programme are outlined in Appendix D.

VIII SUMMARY

A water pollution survey was conducted in the Town of Gore Bay during the Summer of 1969.

The results of the survey indicate that the Town of Gore Bay is contributing to the pollution of the waterfront and local creeks by directly discharging domestic wastes into the above watercourses.

In order to terminate pollution of this nature, the implementation of a municipal sewage works programme is required.

IX RECOMMENDATIONS

It is recommended that a sewage works programme be initiated as outlined in this report as soon as possible.

Prepared by *Robert J. Hopkins*
R. J. Hopkins, P. Engineer,
Division of Sanitary Engineering.

WBM:pr

TABLE I

BACTERIOLOGICAL ANALYSES OF STORM SEWER EFFLUENT---DIRECTLY DISCHARGING INTO GORE BAY

<u>LOCATION</u>	<u>NO.</u>	<u>DATE SAMPLED</u>	<u>FEACAL COLIFORMS/100ml.</u>	<u>TOTAL COLIFORMS/100ml.</u>
North of Dawson St.	0-1	June 25/69 July 24/69	22,200,000 -----	122,000,000 4,100
North side of Rotary Club Park	0-2	June 25/69 July 24/69	19,000 -----	50,000 8,000,000
South side or Rotary Club Park	0-3	June 25/69 July 24/60	15,000 -----	56,000 1,310,000
North of Eleanor Street	0-4	June 25/69 July 24/69	no flow	
Eleanor Street	0-5	June 25/69 July 24/69	1,500	56,000
North of Main Street	0-6	June 25/69 July 24/69	no flow	

TABLE II

CHEMICAL ANALYSES OF STORM SEWER EFFLUENT --- DIRECTLY DISCHARGING INTO GORE BAY

<u>LOCATION</u>	<u>NO.</u>	<u>DATE SAMPLED</u>	<u>5-DAY BOD</u>	<u>SUS. SOLIDS</u>	<u>ABS</u>	<u>TOT. PHOSPHORUS as P</u>	<u>NITROGEN as N TOT. KJELDAHL</u>
North of Dawson Street	0-1	June 25/69	70	50	11	17	20
		July 24/69	18	10	0.1	0.1	*
North side Rotary Club Park	0-2	June 25/69	48	60	3	5	21
		July 24/69	250	490	58	27	32
South side of Rotary Club Park	0-3	June 25/69	150	110	120	60	15
		July 24/69	170	330	50	51	31
North of Eleanor Street	0-4	Sample not obtained due to low flow					
Eleanor Street	0-5	June 25/69 --- Bacteriological sample only					
North of Main Street	0-6	Sample not obtained due to low flow					

Note: all results reported in ppm

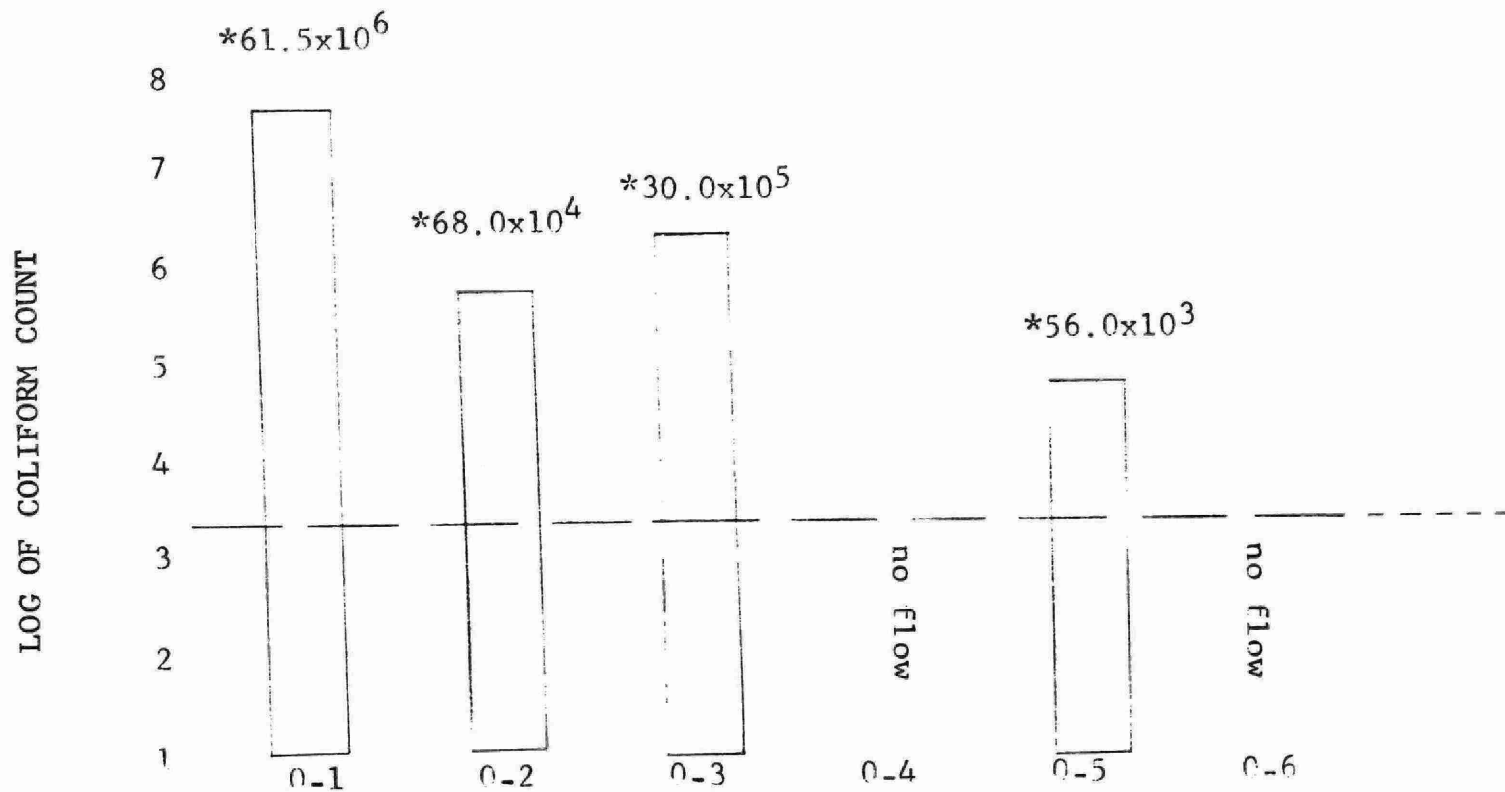
* Sample exhausted

APPENDIX "A"

LOG OF COLIFORM COUNT --- STORM SEWER EFFLUENT

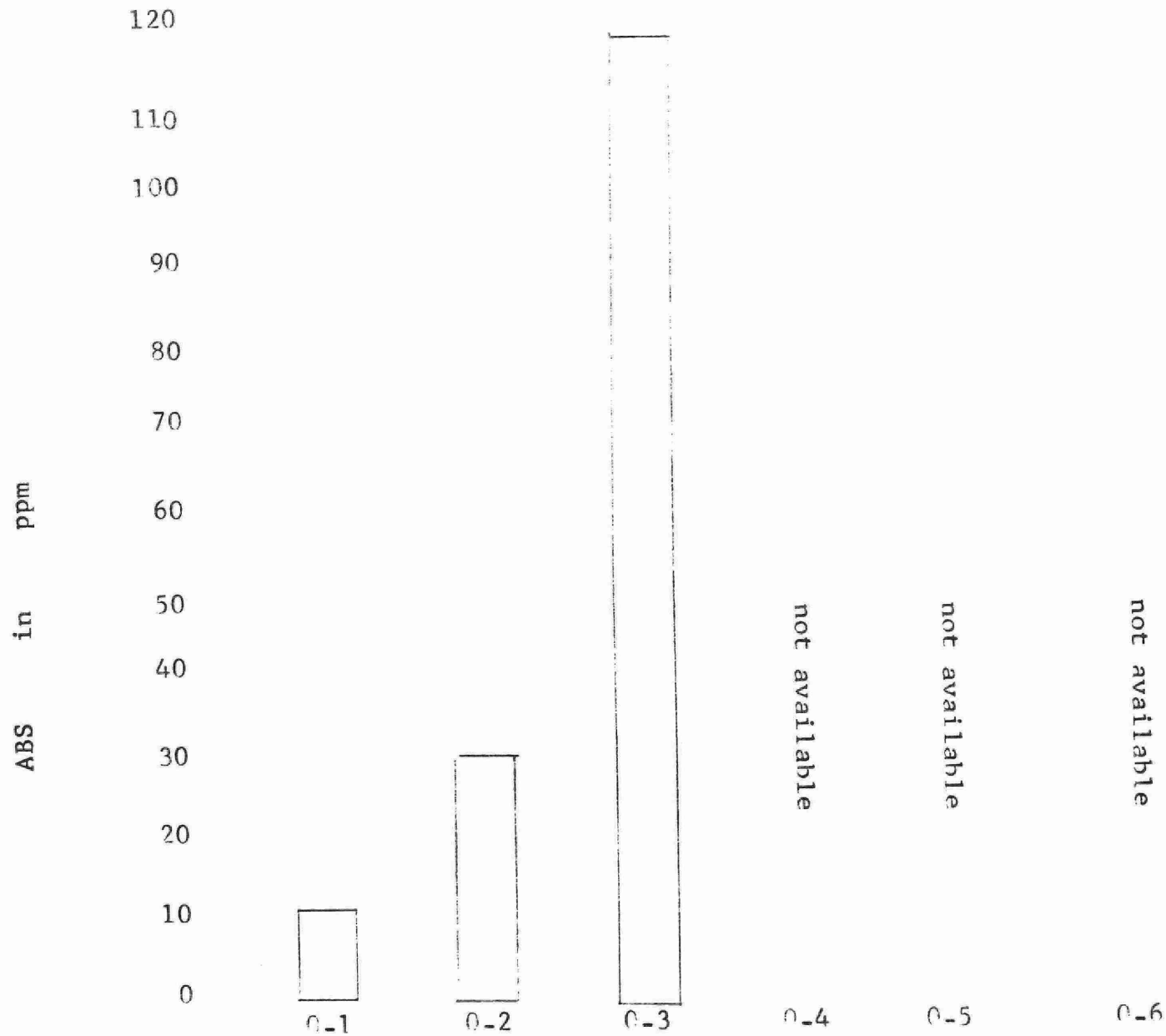
* actual count per 100 ml.

---- recommended maximum limit 2400/100 ml.



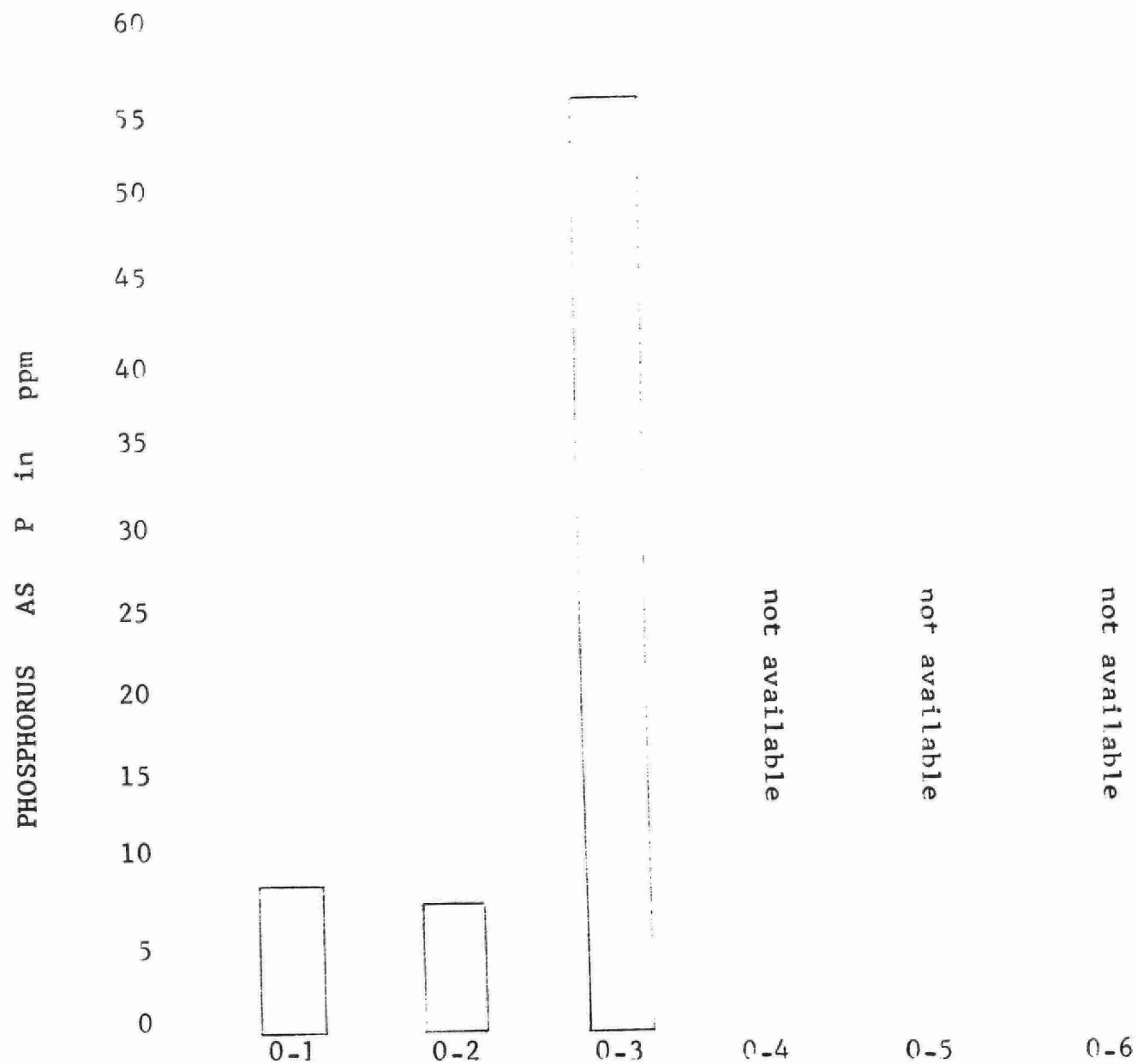
APPENDIX "B"

ALKYL BENZENE SULPHONATE --- STORM SEWER EFFLUENT



APPENDIX "C"

PHOSPHORUS CONCENTRATION --- STORM SEWER EFFLUENT



APPENDIX D

Implementation of Water and Sewage Works Programme

and a

A Statement by The Honourable George A. Kerr, Q.C.

regarding

Two Major Financial Programmes to Assist

Municipalities in Projects Related to Sewage

and Water Works

APPENDIX D

IMPLEMENTATION OF WATER AND SEWAGE WORKS PROGRAMS

Currently, there are three general methods which may be utilized for implementing sewage and water works programs. These are: 1) to enter into an agreement with the OWRC for the construction of the treatment and collector works with an obligation to pay the debt retirement and operating charges over the term of the agreement with the facility reverting to the municipality at the end of the term of the agreement, 2) by requesting the provision of service from a Provincially-owned project, and 3) by proceeding with the construction independently and meeting capital costs by the sale of debentures.

OWRC/MUNICIPAL PROJECTS

For the construction of water and sewage works under agreement with this Commission, the works are provided and developed under Sections 39 to 46 of the Ontario Water Resources Commission Act.

For this type of arrangement, the Commission utilizes a sinking fund and consequently the annual payments are based on a specific debt retirement period and the payments are unchanged for the period of the agreement. This type of project may be financed over a period of time up to a maximum of thirty years. The annual charges for projects constructed under this agreement are determined as follows:

1. Capital Repayment

As noted, OWRC financing is by the sinking fund method and an annual payment of approximately 2 per cent of the capital

cost is required to retire a debt over a thirty-year period.

2. Interest

On new Commission projects, interest is calculated at the current rate.

3. Reserve Fund

To provide money for repairs and replacements, Section 40 of The Ontario Water Resources Commission Act provides for the establishment of a reserve fund by the Commission. It is important to note that this fund is established in the name of the municipality and the balance consequently earns interest. It has now been established by Commission minute that the reserve fund billing for each project shall continue only until the fund reaches an amount of ten times the initial annual billing and the reserve fund billing shall be re-imposed only when the fund has been depleted to 80 per cent or less of the maximum amount.

4. Operating Costs

Under OWRC agreement, the municipality is responsible only for the operating costs directly attributed to the project in the municipality. Therefore, no charges are made by the Commission for the services of head office personnel who are available as required to advise on the satisfactory operation and maintenance of the project.

PROVINCIALY-OWNED WORKS

In June, 1967, the Honourable J. R. Simonett, Minister of Energy and Resources Management, made an announcement which expanded the authorization of this Commission for the provision of water supply and sewage treatment facilities. This new program allows the Commission to construct entire water and sewage works facilities for small municipalities. The capital costs of these can be amortized over a 40 year period.

A slight variation of this program could be implemented in that the municipality may request that this Commission provide only the major water and sewage works facilities as Provincially-owned works, and develop the water distribution and sewage collector systems under the standard type of Commission project. It would appear that where applicable, it would be more advantageous for the municipality to proceed on the basis of requesting this Commission to develop entire systems as Provincially-owned works.

The associated cost of supplying these works, including amortization of capital costs, together with operating and maintenance charges, will be recovered by the sale of service to the affected municipalities by rates determined on a usage basis. These facilities will be wholly-owned by the Province of Ontario and the arrangements for service will be formalized by contracts between the Commission and the municipality concerned. The installations will be operated entirely at cost with appropriate provision for adjustment in rate.

DEVELOPMENT

If a municipality, after considering the alternatives, wishes this Commission to consider Provincially-financed projects, application forms should be completed and submitted together with a resolution of the Municipal council. A draft of the suggested wording of the resolution is included with the application forms.

If the proposed works are to be built by the municipality on its own initiative or as a formal project under agreement with this Commission, it is required that the Council retain a consulting engineer to prepare preliminary engineering reports on the proposed work. If a Provincial system is contemplated, no action should be taken with respect to retaining a consulting engineering firm as the Commission will designate a consulting engineer to carry out the Provincial portion of the work and it would be advantageous if the municipal portion be studied and reported on by the same engineer.

STATEMENT

BY

THE HONOURABLE GEORGE A. KERR, Q.C.
MINISTER OF ENERGY AND RESOURCES MANAGEMENT

REGARDING

TWO MAJOR FINANCIAL PROGRAMMES
TO ASSIST MUNICIPALITIES IN PROJECTS
RELATED TO SEWAGE AND WATER WORKS

THURSDAY, OCTOBER 16, 1969

MR. SPEAKER:

ON BEHALF OF THE GOVERNMENT, I AM PLEASED TO ANNOUNCE THE APPROVAL OF TWO MAJOR FINANCIAL PROGRAMMES TO ASSIST MUNICIPALITIES IN PROJECTS RELATED TO SEWAGE AND WATER WORKS.

APPROVAL HAS NOW BEEN GIVEN TO A SUBMISSION BY THE ONTARIO WATER RESOURCES COMMISSION THAT SOME ASSISTANCE BE GRANTED BY THE GOVERNMENT OF ONTARIO TO SMALL MUNICIPALITIES WITH HIGH COST PROJECTS, SO THAT SEWAGE AND WATER WORKS MAY BE BUILT FOR THESE COMMUNITIES. THE PROGRAMME APPROVED WILL PROVIDE PROVINCIAL ASSISTANCE SUFFICIENT TO ENSURE THAT THE COST OF A SEWAGE WORKS IN A MUNICIPALITY WILL NOT EXCEED AN AVERAGE HOME CHARGE OF \$120 PER YEAR. THE COMMUNITIES REQUIRING SUCH ASSISTANCE ARE ONES FACING UNUSUALLY HIGH COSTS BECAUSE OF TOPOGRAPHY, TYPE OF SOIL OR ROCK, WHICH INCREASES THE CHARGES FOR CONSTRUCTION, OR THOSE WITH A SMALL POPULATION AND LOW ASSESSMENT. THE PROVINCIAL ASSISTANCE PROGRAMME WILL ENSURE, WHERE NECESSARY, EVERY MUNICIPALITY IN ONTARIO WILL BE ABLE TO HAVE ESSENTIAL WATER AND SEWAGE WORKS REGARDLESS OF SIZE.

IN WATER SERVICING, WHEN COSTS RISE ABOVE \$100 PER AVERAGE HOME PER YEAR FOR A COMMUNITY, THE PROVINCE WILL GRANT ASSISTANCE. THE MAXIMUM CONTRIBUTION BY THE PROVINCE FOR BOTH WATER AND SEWAGE WORKS MAY NOT BE GREATER THAN 50% OF THE TOTAL COST OF THE WORKS. THERE MAY BE A FEW CASES, THEREFORE, IN VERY HIGH COST PROJECTS, THAT THE 50% GRANT MAY NOT BE SUFFICIENT TO MEET ALL COSTS ABOVE \$120 OR \$100 PER YEAR FOR SEWAGE AND WATER RESPECTIVELY. AN EXAMPLE IS HALIBURTON, WHERE PROVINCIAL PARTICIPATION OF AN ESTIMATED \$739,000 WILL NOT BE SUFFICIENT TO REDUCE THE SEWAGE CHARGE TO \$120. THE ORIGINAL CHARGE OF \$311 PER HOME WILL BE REDUCED, HOWEVER, TO \$155 PER HOME BY THE APPLICATION OF THIS FORMULA.

THE IMPORTANCE OF PROVIDING THIS ASSISTANCE WILL BE APPRECIATED BY THE HONOURABLE MEMBERS OF THIS HOUSE, SINCE THERE ARE A NUMBER OF COMMUNITIES WILLING TO INSTALL ESSENTIAL SEWAGE AND WATER WORKS, BUT WHICH FIND THE COSTS ARE BEYOND THEIR FINANCIAL CAPACITY TO DO SO. IN SOME CASES THE ONTARIO MUNICIPAL BOARD HAS HAD TO ASK THAT SUCH PROJECTS BE POSTPONED BECAUSE THE PROJECT WAS BEYOND THE FINANCIAL CAPACITY OF THE SMALL COMMUNITY, EVEN WITH PROVINCIAL ASSISTANCE THROUGH OWRC FINANCING.

I BELIEVE THAT EVERYONE IN THE PROVINCE AGREES THAT THE PROGRAMME TO CONTROL POLLUTION MUST ENSURE THAT ALL MUNICIPALITIES HAVE ADEQUATE SEWAGE TREATMENT WORKS. IT IS NOT REALISTIC TODAY TO PERMIT A SMALL COMMUNITY, ALREADY ESTABLISHED FOR MANY YEARS, TO GO WITHOUT THE NECESSITIES OF PURE WATER SUPPLY AND TREATMENT OF WASTES. DOWNSTREAM USERS WILL BENEFIT DIRECTLY FROM SUCH PROJECTS. PROVINCIAL ASSISTANCE WILL AVERAGE APPROXIMATELY 30% OF THE COST FOR MUNICIPALITIES UNDER 5,000 POPULATION. IN THE YEAR 1970-71 THE PROVINCIAL ASSISTANCE WOULD COST AN ESTIMATED \$3,000,000 FOR BOTH SEWAGE AND WATER SYSTEMS, RISING TO \$12,000,000 IN 1971-72 BECAUSE OF THE BACKLOG OF PROJECTS WHICH WILL GET UNDERWAY AT THAT TIME. IT SHOULD DECREASE IN THE YEARS AFTER THAT.

I WANT TO STRESS TO HONOURABLE MEMBERS THAT PROVINCIAL ASSISTANCE FOR SUCH SMALL MUNICIPALITIES IS TO ASSIST THE EXISTING COMMUNITY ONLY AND IS FOR NEW WORKS. THE PROGRAM WOULD NOT APPLY TO ANY FUTURE ADDITION OR EXTENSION OF SUCH NEW PLANT. IN OTHER WORDS THE PROVINCE WILL WORK ITSELF OUT OF THIS PROBLEM BY ASSISTING THOSE WHO NEED ASSISTANCE NOW. THE RATE OF \$120 FOR SEWAGE PER

AVERAGE HOME PER YEAR IS ABOVE THE COST OF ANY OF THE LARGER COMMUNITIES WHO HAVE EITHER FINANCED THEIR OWN WORKS OR CONSTRUCTED SUCH WORKS WITH PROVINCIAL ASSISTANCE. THE SUBSIDY, THEREFORE, DOES NOT CREATE AN ADVANTAGE FOR SMALL COMMUNITIES OVER THE LARGER ONES. I BELIEVE ALL MEMBERS WILL AGREE THAT THIS IS AN EXCELLENT PROGRAMME, INDICATING THE SERIOUSNESS WITH WHICH THE ONTARIO GOVERNMENT VIEWS THE IMPORTANCE OF ESTABLISHING SUCH WORKS IN ALL COMMUNITIES REQUIRING THEM.

THE GOVERNMENT HAS ALSO APPROVED A PROPOSAL FOR FINANCIAL ASSISTANCE TO ENSURE THAT AREA PROJECTS FOR SEWAGE AND WATER MAY BE OVERSIZED FOR FUTURE DEVELOPMENTS. TO QUALIFY, THE OVERSIZING MUST BE BEYOND THE NEEDS OF COMMUNITIES INITIALLY SERVICED. THIS IS REALLY IN ACCORDANCE WITH PROPER PLANNING AND ENGINEERING DESIGN PRINCIPLES AND WILL ENSURE THAT ADEQUATE SERVICES WILL BE AVAILABLE FOR THE PREDICTED POPULATION. UNDER THIS PLAN, THE PROVINCE MAY CONTRIBUTE 15% OF THE TOTAL CAPITAL COST OF WORKS.

WE ARE FACING SUCH POSSIBLE EXPANSION IN THE AREAS OF SARNIA AND ST. THOMAS. AN ADDITIONAL EXPENDITURE OF APPROXIMATELY

15% WILL PERMIT AREA SCHEMES TO SUBSTANTIALLY INCREASE IN CAPACITY. THIS ASSISTANCE WILL BE GRANTED AFTER A CAREFUL REVIEW OF THE PROGRAMME TO ENSURE THAT GROWTH IN THE AREA IS IN THE BEST INTERESTS OF THE PROVINCE. TO DATE THIS ASSISTANCE APPLIES TO THE WORKS CONSTRUCTED TO SERVE THE LAKE ERIE - ST. THOMAS LINE, WHICH WILL PROVIDE CONNECTIONS TO THE COMMUNITIES OF PORT BURWELL, SOUTHWOLD, YARMOUTH, AS WELL AS ST. THOMAS AND THE INDUSTRIAL CONCERNS NORTH OF ST. THOMAS. IT ALSO APPLIES TO THE LAMBTON - SARNIA AREA WATER SYSTEM, AND PERMITS INCREASED CAPACITY TO BE BUILT INTO THIS LINE TO SERVICE THE TOWNSHIPS OF SARNIA, MOORE AND SOMBRA AND THE COMMUNITIES OF CORUNNA, COURTRIGHT, SOMBRA, PORT LAMBTON AND BRIDGEN. THE OWRC IS PRESENTLY STUDYING SUCH OVERSIZING FOR A SYSTEM IN THE EASTERN LAKE ERIE SECTION NORTH OF NANTICOKE.

IT IS BECOMING INCREASINGLY APPARENT TO ME THAT AREA PROGRAMMES WILL BECOME MORE ESSENTIAL, PARTICULARLY GUARANTEEING WATER SUPPLY FOR COMMUNITIES INLAND OF THE GREAT LAKES. IT IS NO LONGER ADEQUATE FOR US TO RELY ON GROUND WATER SUPPLY ALONE FOR

RAPIDLY DEVELOPING ONTARIO COMMUNITIES. THE INCREASED CAPACITY OF SUCH AREA PROGRAMMES WILL PERMIT BOTH RESIDENTIAL AND INDUSTRIAL DEVELOPMENT TO TAKE PLACE WITH ADVANCED PLANNING BY THOSE DIRECTLY INVOLVED, UNDER THE GENERAL DIRECTION OF THE DEPARTMENT OF MUNICIPAL AFFAIRS.

THE GOVERNMENT OF ONTARIO IS PLEASED TO ANNOUNCE THESE NEW POLICIES. THIS STATEMENT IS TO INDICATE TO THE HOUSE THE SERIOUSNESS WITH WHICH WE VIEW THE NEEDS OF SERVICING ONTARIO COMMUNITIES. THE RESULTS CAN ONLY BE TO THE BENEFIT OF THE ENTIRE PROVINCE.

APPENDIX E

SIGNIFICANCE OF LABORATORY RESULTS

APPENDIX E

SIGNIFICANCE OF LABORATORY ANALYSES

Bacteriological Examination

The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. The objectives for surface water quality in Ontario is a maximum of 2400 organisms per 100 millilitres.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Member (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (PPM) and is an indicated of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in water. The completion of the laboratory test required five days, under the controlled incubation temperature of 20° Centigrade.

The OWRC objective for surface water quality is an upper limit of four (4) ppm.

Solids

The value for solids, expressed in parts per million, is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally

the most significant of the solids analyses with regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, decomposition in streams and injury to the habitat of fish.

Nitrogen

Ammonia Nitrogen or sometimes called free ammonia is the insoluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03 ppm; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl is a measure of the total nitrogenous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia Nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

Nitrite Nitrogen

Nitrite is usually an intermediate oxidation of ammonia. The significance of nitrites, therefore, varies with their amount, sources, and relation to other constituents of the

sample, notably the relative magnitude of ammonia and nitrite present. Since nitrite is rapidly and easily converted to nitrate, its presence in concentrations greater than a few thousandths of a part per million is generally indicative of active biological processes in the water.

Nitrate Nitrogen

Nitrate is the end product of aerobic decomposition of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide: low less than 0.1 ppm; moderate 0.1 to 1.0 ppm; high greater than 1.0 ppm.

Anionic Detergents as ABS

The presence of anionic detergents as ABS is an indication that domestic waste is present.

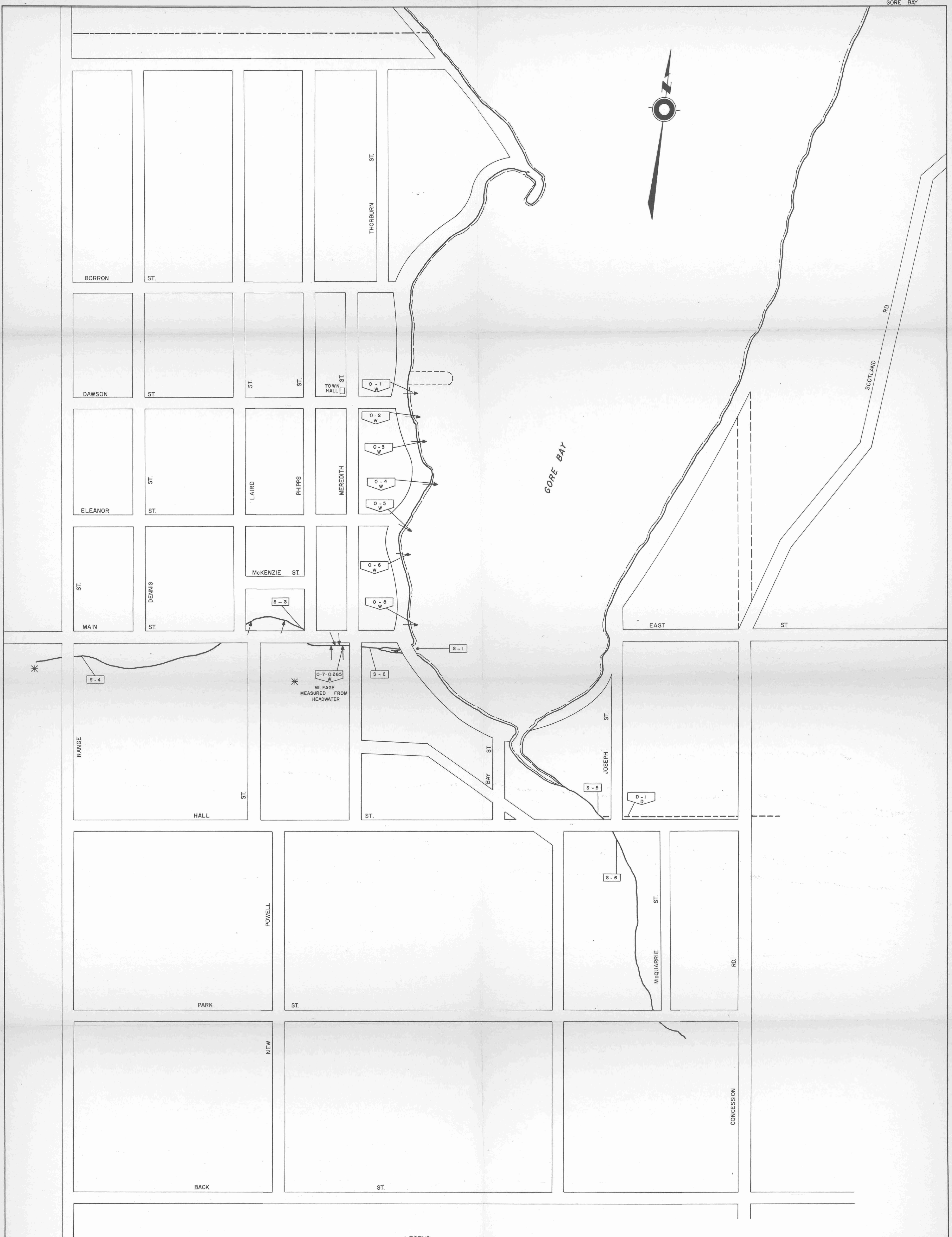
Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from some industries. It is generally conceded that adequate protection of surface waters will be provided if the concentration of phenols in waste discharges does not exceed

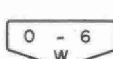

20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.

Iron

Water for domestic use should contain less than 0.3 parts per million of iron in order to avoid objectionable tastes, staining and sediment formation. Iron concentrations of not greater than 17 parts per million in waste discharges should permit adequate protection of surface waters.



LEGEND

-  OUTFALL SAMPLING POINT
-  STREAM SAMPLING POINT
- TYPE OF OUTFALL
- D DITCH
- W STORM SEWER

Out
Emission
water treat



ONTARIO WATER RESOURCES COMMISSION	
TOWN OF GORE BAY	
WATER POLLUTION SURVEY	
1969	
SCALE: 300 150 0 600 FEET	
DRAWN BY: R. HUNT	DATE: NOV. 1969
CHECKED BY:	DWG. NO: 69-210-DE



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